# INSECTS ASSOCIATED WITH KENAF IN NORTHERN QUEENSLAND

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**Abstract**

A list is given of 46 species recorded feeding on kenaf in the Burdekin River Irrigation Area in northern Queensland. The damaging stage of the insect and the plant part attacked are noted. Only two species, the beetle *Monolepta australis* (Jacoby) and the moth *Anomis flava* (F.) were of major importance. An additional 88 species, which were not recorded feeding on kenaf, were collected in the crop.

## Introduction

Kenaf (*Hibiscus cannabinus* L., family Malvaceae) is an herbaceous annual plant with a straight stem that grows 4-5 m high. Traditionally kenaf has been used as an important textile fibre in south-east Asia and other tropical areas. However the stems can be used to produce paper pulp and there has been interest in kenaf for this purpose in Australia since the early 1950's. Wood (1981, 1984) reviewed research on kenaf as a source of paper pulp.

Since 1984 kenaf has been investigated as a potential crop for the Burdekin River Irrigation Area (BRIA), based on the town of Ayr (19°35'S 147°24'E), in the dry tropics of northern Queensland (Hazzard *et al.*, 1988). As part of these studies we sampled the insect fauna associated with kenaf to determine pests and potential pests of the crop. Ferraris (1979) reported that it was necessary to control beetles from the genera *Monolepta* and *Rhyparida* (Chrysomelidae), and *Henosepilachna* (= *Epilachna*) (Coccinellidae) on kenaf in the wet tropics of Queensland, and Strickland and Learmonth (1981) recorded pests and potential pests of kenaf in the Ord Irrigation Area of Western Australia. In the latter area *Anomis* spp. (Noctuidae) were considered to be the major pests, and a complex of plant bugs and bollworms were important in seed production.

## Methods

Collections were made from experimental crops (1-10 ha in area) of kenaf throughout the BRIA during the 1984-85, 1985-86, and 1986-87 growing seasons. The crops were irrigated and in general were surrounded by sugar cane. The kenaf growing season extends from October to May. Crops were visited throughout each season and representatives of insects observed were collected by hand or with a sweep net, and immature insects were reared to adults on kenaf in the laboratory. Plant parts attacked were noted. Neither the ground fauna nor spiders were sampled.

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**Table 1.** Insects feeding on kenaf. (Plant part damaged: y - seedling; l - leaf; s - stem; t - terminal; f - flower bud, open flower; c - seed capsule).

| Insects | Damaging stage | Plant part damaged |
|---|---|---|
| COLEOPTERA | | |
| Cerambycidae | | |
| *Zygrita diva* Thomson | adult | s |
| Chrysomelidae | | |
| *Aulacophora abdominalis* (F.) | adult | l |
| *Chaetocnema* sp. | adult | l |
| *Cleptor* sp. | adult | l |
| *Monolepta australis* (Jacoby) | adult | l |
| *Podagrica submetallica* (Blackburn) | adult | y,l |
| *Rhyparida* ? *dimidiata* Baly | adult | l |
| Coccinellidae | | |
| *Epilachna cucurbitae* Richards | adult | l |
| *Epilachna vigintioctopunctata pardalis* (Boisduval) | larva | l |
| *Epilachna vigintisexpunctata vigintisexpunctata* (Boisduval) | adult | l |
| Curculionidae | | |
| *Baris* (*Cosmobaris*) sp. | adult | l,t |
| Nitidulidae | | |
| *Aethina nigra* (Reitter) | adult | l |
| HEMIPTERA - HOMOPTERA | | |
| Aphididae | | |
| *Aphis craccivora* Koch | nymph, adult | y |
| *Aphis gossypii* Glover | nymph, adult | y,c |
| Coccidae | | |
| 1 unidentified sp. | nymph, adult | s |
| Diaspididae | | |
| *Pinnaspis strachani* (Cooley) | adult | s |
| Flatidae | | |
| *Colgar* sp. | nymph, adult | l |
| *Siphanta patruelis* (Stål) | nymph, adult | l |
| HEMIPTERA - HETEROPTERA | | |
| Pseudococcidae | | |
| unidentified sp. | nymph, adult | t |
| Coreidae | | |
| *Aulacosternum nigrorubrum* Dallas | adult | l ,f |
| Lygaeidae | | |
| *Oxycarenus luctuosus* (Montrouzier and Signoret) | nymph, adult | c,t |
| Miridae | | |
| *Campylomma livida* Reuter | adult | t,f |
| Pentatomidae | | |
| *Nezara viridula* (L.) | nymph, adult | f,c |
| *Piezodorus hybneri* (Gmelin) | adult | l,f |
| *Plautia affinis* Dallas | nymph, adult | l,t,c |

**Table 1 (cont.).** Insects feeding on kenaf. (Plant part damaged: y - seedling; l - leaf; s - stem; t - terminal; f - flower bud, open flower; c - seed capsule)

| Insects | Damaging stage | Plant part damaged |
|---|---|---|
| Pyrrhocoridae | | |
| *Dysdercus cingulatus* (F.) | adult | c |
| *Dysdercus sidae* Montrouzier | nymph, adult | c |
| Scutelleridae | | |
| *Lampromicra senator* (F.) | adult | c |
| *Tectocoris diophthalmus* (Thunberg) | nymph, adult | c |
| LEPIDOPTERA | | |
| Gelechiidae | | |
| *Pectinophora scutigera* (Holdaway) | larva | f,c |
| Lymantriidae | | |
| *Euproctis* sp. | larva | f |
| Noctuidae | | |
| *Acontia graellsi* Feisthamel | larva | l |
| *Acontia transversa* Guenée | larva | l |
| *Agrotis* sp. | larva | y |
| *Anomis flava* (F.) | larva | l |
| *Anomis fulvida* (Guenée) | larva | l |
| *Earias huegeli* Rogenhofer | larva | t,c |
| *Earias vittella* (F.) | larva | t,c |
| *Eublemma versicolor* (Walker) | larva | t |
| *Helicoverpa armigera* (Hübner) | larva | t,l,f,c |
| *Helicoverpa punctigera* (Wallengren) | larva | l,f,c |
| *Nanaguna breviuscula* Walker | larva | f,c |
| *Spodoptera litura* (F.) | larva | l |
| Pyralidae | | |
| *Cryptoblabes adoceta* Turner | larva | f,c |
| *Loxostege affinitalis* (Lederer) | larva | l |
| THYSANOPTERA | | |
| Phlaeothripidae | | |
| *Haplothrips gowdeyi* (Franklin) | adult | l,f |

**Results and Discussion**

The insect species recorded feeding on kenaf are listed in Table 1 together with the stage causing damage, and the parts of the plant attacked. All Lepidoptera listed in Table 1 were collected as larvae and reared to the adult stage for identification (except for *Agrotis* sp. (Noctuidae) which failed to develop). Forty-six species from 21 families in 4 Orders were identified as pests or potential pests. Only two, *Monolepta australis* and *Anomis flava*, were of major importance. *M. australis*, the redshouldered leaf beetle, was the most important pest, occurring throughout each season in all crops. The adults preferred young leaves but also fed on old ones, and caused

serious defoliation if uncontrolled. P. Elliot (pers. comm.) recorded adverse effects on stem yield caused by such defoliation. The beetle was controlled effectively with carbaryl at 1 kg a.i./ha.

*A. flava*, the cotton looper, also caused serious defoliation to several crops. Usually infestations were controlled by parasites and predators. Strickland and Learmonth (1981) considered *Anomis* spp. to be the most important defoliators of kenaf in the Ord Irrigation Area.

Flea beetles, *Podagrica* spp., are major pests of kenaf in the Sudan, killing seedlings by feeding on their cotyledons and leaves (Sharaf Eldin and El-Amin, 1981). Although adults of *Podagrica submetallica* were common on kenaf during this study, feeding on the leaves of seedlings and older plants, no serious damage was noted.

Hill (1983) lists pests of kenaf in India and gives *Maconellicoccus hirsutus* (Green), the hibiscus mealybug, as the most important pest. We recorded a pseudococcid from kenaf terminals but were unable to identify it, and its incidence was low. However in March 1990 kenaf plants in small experimental plots at Ayr suffered severe terminal stunting typical of that caused by *M. hirsutus* (Hill, 1983). It was not possible to identify the mealybug as predatory coccinellids quickly controlled the infestation. *M. hirsutus* has been recorded from other hosts in the district. Many of the other insects listed by Hill (1983) as minor pests in India were recorded in this study.

The insects that fed on the reproductive structures of the plant (flowers and seed capsules) were of no importance in kenaf crops grown for the stems but they would be of concern in crops grown for seed production. Common amongst the insects feeding on flowers and seed capsules were larvae of the noctuids *Helicoverpa* spp. and *Earias* spp., and *Pectinophora scutigera* (Gelechiidae), and adults and nymphs of *Oxycarenus luctuosus* (Lygaeidae), *Nezara viridula* (Pentatomidae), *Dysdercus* spp. (Pyrrhocoridae), and *Tectocoris diophthalmus* (Scutelleridae). This complex is similar to that recorded by Strickland and Learmonth (1981).

Of the three genera reported by Ferraris (1979) as major pests of kenaf in the wet tropics of northern Queensland *M. australis* was a major pest and *Epilachna* spp. and *Rhyparida* ? *dimidiata* were uncommon in the BRIA. This difference may be due to the climatic differences and/or differences in the native vegetation between the wet and dry tropics.

Table 2 lists another 88 species recorded in kenaf. It is probable that some of these may feed on kenaf although they were not seen to do so. The list contains many parasitic and predatory insects, indicating that control measures taken against pests should be taken cautiously so

**Table 2.** Other insects associated with kenaf

| Insects | Comments |
|---|---|
| BLATTODEA | |
| Blattellidae | |
| *Ellipsidion variegatum* (F.) | |
| unidentified sp. | |
| COLEOPTERA | |
| Apionidae | |
| *Apion* sp. | |
| Cerambycidae | |
| *Prosoplus torosa* Pascoe | |
| Chrysomelidae | |
| *Aphthona* sp. | |
| *Psylliodes* sp. | |
| unidentified sp. (Halticinae) | |
| Cleridae | |
| *Zenithicola crassus* Newman | |
| Coccinellidae | |
| *Coccinella repanda* Thunberg | |
| *Coelophora inaequalis* (F.) | |
| *Cryptolaemus montrouzieri* Mulsant | |
| *Halmus ovalis* Blackburn | |
| *Harmonia octomaculata* (F.) | |
| *Micraspis frenata* (Erichson) | |
| *Scymnus* (*Pullus*) *mitior* Blackburn | |
| Curculionidae | |
| *Alcides bubo* F. | |
| *Centyres* sp. | |
| *Lixus* sp. | |
| Helodidae | |
| unidentified sp. | |
| Languriidae | |
| *Languria* sp. | |
| Lathridiidae | |
| *Melanopthalmus* sp. | |
| Nitidulidae | |
| *Carpophilus* ? *dimidiatus* (F.) | in flowers |
| *Carpophilus* ? *marginellus* Motschulsky | in flowers |
| Staphylinidae | |
| *Paederus cruenticollis* Germar | |
| DIPTERA | |
| Agromyzidae | |
| *Pseudonapomyza* sp. | |
| Calliphoridae | |
| *Stomorhina xanthogaster* (Wiedemann) | |
| Drosophilidae | |
| *Drosophila hibisci* Bock | in flower |
| *Gitonoides perspicax* Knab | associated with mealybugs |
| Sarcophagidae | |
| *Parasarcophaga* sp. | |

**Table 2 (cont.).** Other insects associated with kenaf.

| Insects | Comments |
|---|---|
| Tachinidae | |
| *Carcelia cosmophilae* (Curran) | bred from *A. flava*, *Helicoverpa* sp. |
| *Carcelia illota* (Curran) | bred from *A. transversa*, *A. flava* |
| *Exorista sorbillans* (Wiedemann) | bred from *A. flava* |
| *Goniophthalmus australis* (Baranov) | bred from *H. armigera* |
| HEMIPTERA - HOMOPTERA | |
| Cicadellidae | |
| unidentified sp. | |
| Cixiidae | |
| *Oliarus lubra* Kirkaldy | |
| *Oliarus* sp. | |
| HEMIPTERA - HETEROPTERA | |
| Alydidae | |
| *Noliphus* sp. | |
| *Riptortus* sp. | |
| Coreidae | |
| *Cletomorpha* sp. | |
| Lygaeidae | |
| *Arocatus* sp. | |
| *Aspilocoryphus australicus* Stål | |
| *Germalus* sp. | |
| *Graptostethus* sp. | |
| *Nysius vinitor* Bergroth | |
| *Spilostethus hospes* (F.) | |
| Miridae | |
| *Deraeocoris signatus* (Distant) | |
| 4 unidentified spp. | |
| Nabidae | |
| *Nabis kinbergii* Reuter | |
| Pentatomidae | |
| *Cermatulus nasalis* (Westwood) | feeding on *A. flava* |
| *Oechalia schellenbergii* (Guérin-Méneville) | |
| *Oncocoris* sp. 1 | |
| *Oncocoris* sp. 2 | |
| Reduviidae | |
| *Polytoxus* sp. | |
| *Pristhesancus plagipennis* Walker | |
| *Scipinia arenacea* Distant | feeding on *M. australis* |
| HYMENOPTERA | |
| Apidae | |
| *Apis mellifera* L | |
| Bethylidae | |
| *Goniozus* sp. | |
| Braconidae | |
| *Microgaster* sp. | bred from *Helicoverpa* sp. |

**Table 2 (cont.).** Other insects associated with kenaf.

| Insects | Comments |
|---|---|
| HYMENOPTERA (Cont.) | |
| Chalcididae | |
| *Brachymeria* sp. | bred from *A. flava* |
| Encyrtidae | |
| unidentified sp. | |
| Formicidae | |
| *Iridomyrmex* sp. | |
| *Tetramorium guineense* (F.) | |
| Ichneumonidae | |
| *Echthromorpha agrestoria* (Swederus) | bred from *A. flava* |
| *Enicospilus* ? *samoana* (Kohl) | bred from *A. flava* |
| *Eriborus* sp. | bred from *C. adoceta*, *Earias* sp. |
| *Heteropelma scaposum* (Morley) | bred from *Helicoverpa* sp. |
| *Temelucha* sp. | bred from *C. adoceta* |
| Perilampidae | |
| *Euperilampoides scutellatus* Girault | |
| Pteromalidae | |
| *Coruna* sp. | bred from heteropteran eggs |
| Scelionidae | |
| *Trissolcus basalis* (Wollaston) | bred from heteropteran eggs |
| *Trissolcus* sp. 1 | bred from *T. diophthalmus* eggs |
| *Trissolcus* sp. 2 | bred from heteropteran eggs |
| *Trissolcus* sp. 3 | bred from heteropteran eggs |
| LEPIDOPTERA | |
| Blastobasidae | |
| *Blastobasis* sp. | |
| Noctuidae | |
| *Acontia thapsina* (Turner) | |
| Pyralidae | |
| *Endotricha puncticostalis* Walker | |
| MANTODEA | |
| Mantidae | |
| *Orthodera ministralis* (F.) | |
| NEUROPTERA | |
| Chrysopidae | |
| *Chrysopa ramburi* Schneider | larva feeding on mealybugs |
| *Chrysopa signata* Schneider | |
| ORTHOPTERA | |
| Gryllidae | |
| *Homoeoxipha lycoides* (Walker) | |
| *Madasumma affinis* Chopard | |
| *Oecanthus rufescens* Serville | |
| *Pteronemobius* sp. | |
| Tettigoniidae | |
| *Hexacentrus* sp. | |
| *Phaneroptera gracilis* Burmeister | |

as to conserve the beneficial species. Others are probably vagrants or of no economic significance.

It is unlikely that these lists are exhaustive, but we hope that most of the potential pests have been identified. The lists will serve as a base for additional records over time.

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